

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 69623

CSAH NO. 27

OVER THE

ST. LOUIS RIVER

DISTRICT 1 - ST. LOUIS COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge No. 69623, Pier 1, was found to be in good condition, although a heavy accumulation of timber debris was observed at the upstream nose of Pier 1. The channel bottom appeared to be in stable condition with no evidence of significant scour.

INSPECTION FINDINGS:

- (A) The concrete of Pier 1 was smooth and sound with no notable deterioration.
- (B) A heavy accumulation of timber debris was observed at the upstream nose of Pier 1. The accumulation extended approximately 30 feet into the channel, and from about 20 feet upstream of the nose to halfway down the east side of the pier, with a 2-foot-diameter log extending along the west side of the pier.
- (C) A band of light scaling was observed around the entire perimeter of Pier 1 extending from the waterline to 1.5 feet above the waterline, with 1/8 inch maximum penetrations.

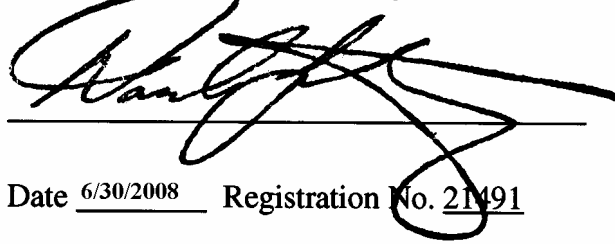
RECOMMENDATIONS:

- (A) Remove the heavy accumulation of timber debris at the upstream nose and along the side of Pier 1 to alleviate scour influence at the pier and any further accumulation.

- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over a horizontal line.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Daniel G. Stromberg', is written over a horizontal line.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 69623

Feature Crossed: St. Louis River

Feature Carried: CSAH No. 27

Location: District 1 - St. Louis County

Bridge Description: Bridge No. 69623 consists of a two span, multiple prestressed concrete beam superstructure supported by two concrete abutments and one concrete pier.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 24, 2007

Weather Conditions: Sunny, 55°F

Underwater Visibility: 1.0 foot

Waterway Velocity: 1.0 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 1

General Shape: The pier consists of an oblong rectangular shaft with rounded noses, which rests upon a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 5.8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the upstream end of Pier 1.

Water Surface: The waterline was approximately 26.8 feet below reference.
Assumed Waterline Elevation = 1265.2.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code F/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

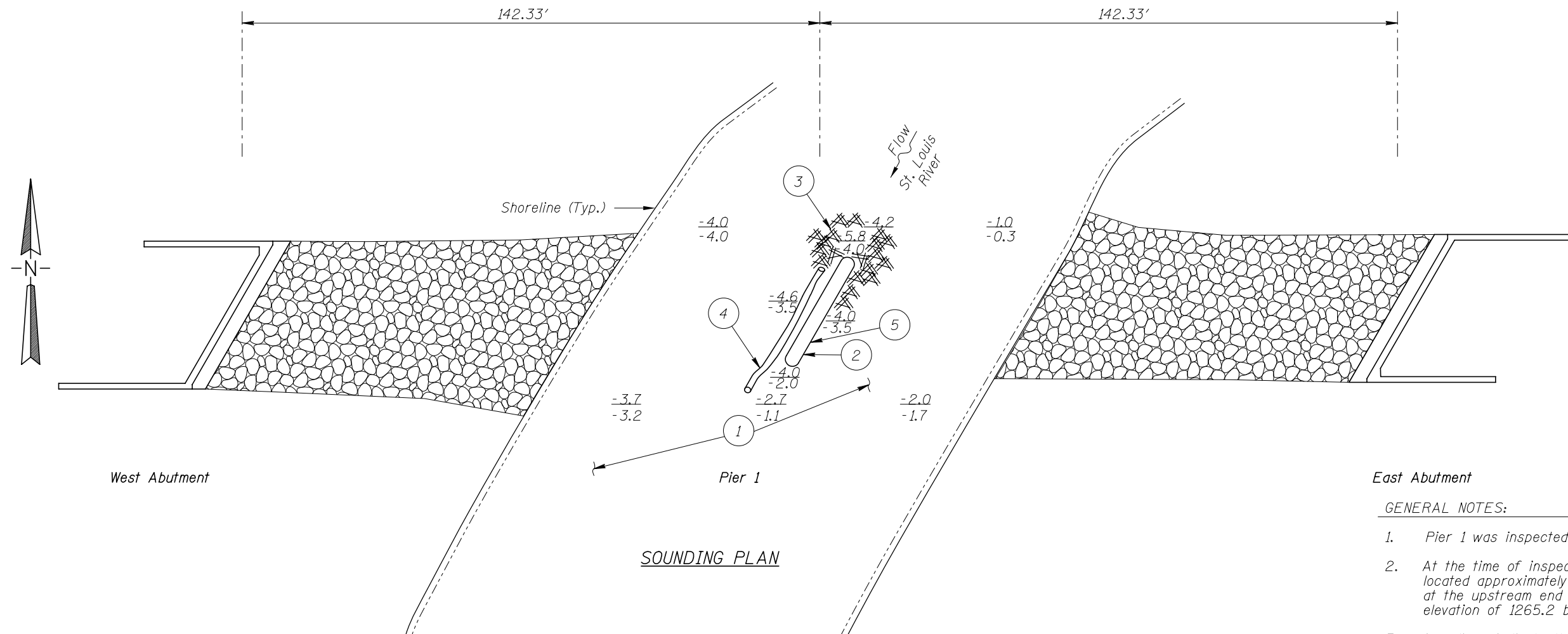
 Yes X No



Photograph 1. Overall View of Structure, Looking Southwest.



Photograph 2. View of Pier 1 and Drift Accumulation, Looking Northeast.

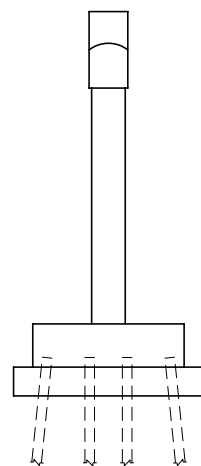


GENERAL NOTES:

- Pier 1 was inspected underwater.
- At the time of inspection on August 23, 2007, the waterline was located approximately 26.8 feet below the top of the pier cap at the upstream end of Pier 1. This corresponds to a waterline elevation of 1265.2 based on design drawings.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom consisted of soft silt with 1.5 to 2 feet of probe rod penetration and riprap at the upstream nose of Pier 1.
- The concrete of Pier 1 was smooth and sound.
- A heavy accumulation of timber debris was observed at the upstream nose of Pier 1 extending from the channel bottom to 6 feet above the waterline. The accumulation extended approximately 30 feet into the channel and from about 20 feet upstream of the nose to halfway down the east side of the pier, with a 2-foot-diameter log extending along the west side of the pier.
- A 2-foot-diameter log was observed along the west side of Pier 1.
- Light scaling was observed around entire pier from waterline to 1.5 feet above the waterline with 1/8 inch max penetration.



TYPICAL END VIEW OF PIERS

Legend

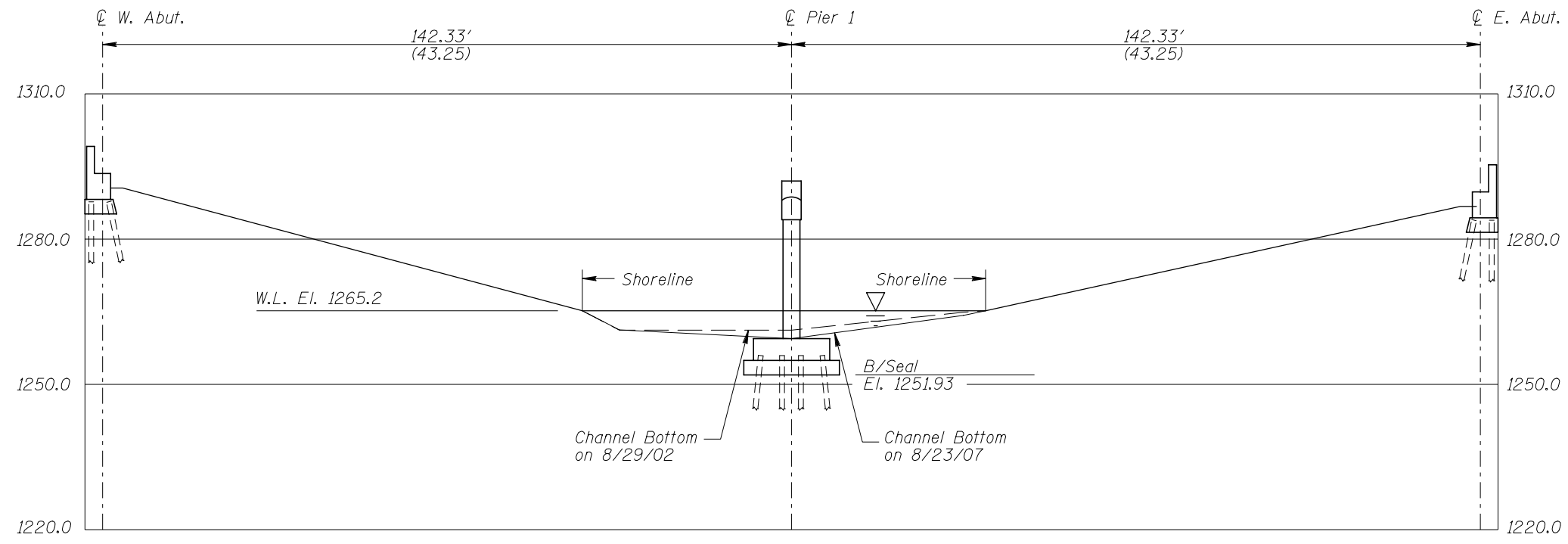
- 6.5 Sounding Depth (8/23/07)
 -6.0 Sounding Depth (8/29/02)
- Timber Debris
- Riprap

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

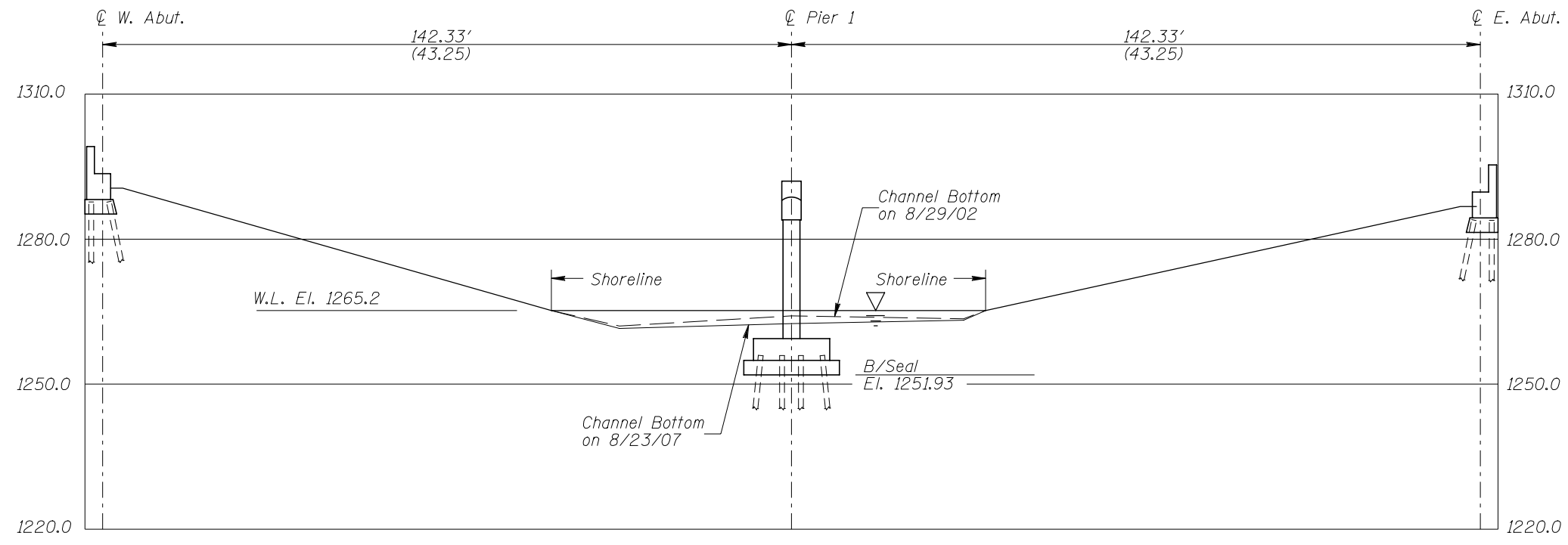
STRUCTURE NO. 69623
 OVER THE ST. LOUIS RIVER
 DISTRICT I, ST. LOUIS COUNTY

INSPECTION AND SOUNDING PLAN

| | | |
|-----------------|--|-----------------|
| Drawn By: PRH | COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small> | Date: AUG. 2007 |
| Checked By: MDK | | Scale: NTS |
| Code: 522169623 | | Figure No.: I |



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 69623
OVER THE ST. LOUIS RIVER
DISTRICT I, ST. LOUIS COUNTY
**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

| | | |
|-----------------|--|-----------------|
| Drawn By: PRH | COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small> | Date: AUG. 2007 |
| Checked By: MDK | | Scale: 1"=30' |
| Code: 522169623 | | Figure No.: 2 |

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 24, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 69623 WEATHER: Sunny, 55° F

WATERWAY CROSSED: St. Louis River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 5:45 p.m.

TIME OUT OF WATER: 6:10 p.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s

VISIBILITY 1.0 feet

DEPTH 5.8 feet maximum at Pier 1

ELEMENTS INSPECTED: Pier 1

REMARKS: Overall, the concrete was smooth and sound. A heavy accumulation of timber debris, extending 20 feet upstream of the upstream nose and 30 feet into the channel on the east side, was observed at Pier 1. A 2-foot-diameter log, extending along the entire length of the west side of the pier was also observed. Light scaling was observed around the entire perimeter of Pier 1 from the waterline to 1.5 feet above the waterline with 1/8 inch maximum penetration.

FURTHER ACTION NEEDED: X YES NO

Remove the heavy accumulation of timber debris at the upstream nose and along the side of Pier 1 to alleviate scour influence and any further accumulation.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 69623
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED St. Louis River

INSPECTION DATE August 24, 2007
NOTE: USE ALL APPLICABLE CONDITION
DEFINITIONS AS DEFINED IN THE MINNESOTA
RECORDING AND CODING GUIDE INCLUDING
GENERAL, SUBSTRUCTURE, CHANNEL AND
PROTECTION, AND CULVERTS AND WALL
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

| UNIT REFERENCE NO. | UNIT DESCRIPTION | MAXIMUM DEPTH OF WATER | SUBSTRUCTURE | | | | | | CHANNEL | | | | | GENERAL | | | | | |
|--------------------|------------------|------------------------|--------------|-------------------------------|----------|--------------|-----------------|---|---------|--------------------|-----------------------|----------------------|---|----------|-------|--------|-----------------|-----------------------------------|-------|
| | | | PILING | COLUMNS, SHAFTS, OR FACES* | FOOTINGS | DISPLACEMENT | OTHER (BRACING) | OVERALL SUBSTRUCTURE CONDITION CODE* | SCOUR | EMBANKMENT EROSION | EMBANKMENT PROTECTION | OTHER (DRIFT/DEBRIS) | OVERALL CHANNEL & PROTECTION CONDITION | CONCRETE | STEEL | TIMBER | LOSS OF SECTION | PREVIOUS REPAIR OR MAINTENANCE | OTHER |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | Pier 1 | 5.8' | N | 8 | N | 9 | N | 8 | 8 | 8 | 8 | 5 | 7 | 8 | N | N | N | N | N |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was smooth and sound. A heavy accumulation of timber debris, extending 20 feet upstream of the upstream nose and 30 feet into the channel on the east side, was observed at Pier 1. A 2-foot-diameter log, extending along the entire length of the west side of the pier was also observed. Light scaling was observed around the entire perimeter of Pier 1 from the waterline to 1.5 feet above the waterline with 1/8 inch maximum penetration.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.